

If the revision to the conception of the phenomenon is so major that little of what the mechanism was thought to be doing is still recognized as occurring, the work toward articulating the mechanism for the phenomenon as originally characterized may prove to have been in vain. Most often, though, the change in the characterization of the phenomenon takes the form of a revision, not a wholesale replacement of the old conception, and the changes in the account of the mechanism are accordingly more restricted. For example, early investigators construed fermentation as a catabolic activity breaking down sugar and yielding alcohol (with heat as a by-product). Once researchers recognized that the energy released was captured in high-energy phosphate bonds that were used as energy sources for other cell activities, the conception of the phenomenon to be explained was revised. It was now a mechanism for converting the energy of foodstuffs into a form useful in such other activities as cell division. Yet, because the catabolic breakdown of sugar to alcohol remains part of this process, much that had been learned about the mechanism of fermentation still applied after the phenomenon had been reconceptualized.

It bears emphasizing that the project of providing explanations, including mechanistic explanations, starts with the identification of a phenomenon. This is where the functioning structure gets determined, constraining what will count as a successful identification of relevant parts and operations and their organization (Kauffman, 1971). If the operation of some entity does not contribute to the production of a given phenomenon, it is not part of the mechanism responsible for that phenomenon. On this construal, different mechanisms may be instantiated in the same substance in the same spatial-temporal region and may share many component parts and operations. What unites one set of parts and operations into a given mechanism is their organization and their orchestrated functioning in producing a particular phenomenon.

I will conclude this discussion of phenomena by introducing an illustration I will continue to use to characterize various features of a mechanism. After the investigations of Harvey, pumping of blood through the circulatory system was a well delineated phenomenon. Although we now take the phenomenon to be obvious, until Harvey established the more general phenomenon of the circulation of the blood, the phenomenon of pumping blood was not recognized. Rather than conceiving of circulation, investigators assumed that both the arteries and veins transported material to the bodily tissues and that this phenomenon was readily accounted for as a result of newer material pushing older material along. Once Harvey established that the blood circulated, the need for a pump to move blood was recognized and the functioning